APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,891	03/31/2004	Robert E. Cypher	5181-99301	5747

35690 7590 08/10/2006	EXAMINER	
MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C.	PATEL, KAUSHIKKUMAR M	

700 LAVACA, SUITE 800	ART UNIT	PAPER NUMBER
AUSTIN, TX 78701	2188	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/813,891	CYPHER, ROBERT E.
	Examiner	Art Unit
	Kaushikkumar Patel	2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 March 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>31 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>7/11/2005</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on July 11, 2005 has

considered by the examiner.

Claim Objections

2.   Applicant is advised that should claims 1 and 17 found allowable, claims 4-5 and

20-21 will be objected to under 37 C.F.R. 1.75 as being a substantial duplicates thereof.

When two claims in an application are duplicates or else are so close in content that

they both cover the same thing, despite a slight difference in wording, it is proper

allowing one claim to object to the other as being a substantial duplicate of the allowed

claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

4.   Claims 2-3, 6, 18-19 and 22 are rejected under 35 U.S.C. 112, first paragraph, as

failing to comply with the enablement requirement. The claim(s) contains subject

matter, which was not described in the specification in such a way as to enable one

skilled in the art to which it pertains, or with which it is most nearly connected, to make

and/or use the invention.

As per claims 2, 6, 18 and 22, It is understood from the specification (see

PGPUB # US 2004/0215895 A1 (all references made to specification during this office

action are with respect to this publication), paragraphs [0223] – [0225]) that specific

coherency unit is either "mapped coherency unit" or "non-mapped coherency unit". But

specification failed to provide specific reasons, why specific coherency unit is "mapped"

or "not-mapped" by the node? Further, the paragraphs [0242] – [0243] teaches that

"active device D1's RTO request may be conveyed by the address network in

requesting node 140R in either BC or PTP mode (e.g. indicated by a mode table)", and

further in paragraph it is taught that "non-mapped" (or mapped) coherency is conveyed

in broadcast (or point-to-point) mode. It will be difficult to one having ordinary skill in the

art to ascertain why particular coherency is mapped/not-mapped by the memory system

and why it is conveyed in BC/PTP mode by the address network?

Claims 3 and 19 are also rejected due their dependency on rejected claims 2 and

18.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter, which the applicant regards as his invention.

6.   Claims 1 and 17 recite the limitations "an address network" and "address

packets" in lines 7, 12 and 7, 11 respectively. There is insufficient antecedent basis for

these limitations in the claims.

Claims 2, 4, 18 and 20 recite the limitation "the address network" in lines 3, 4, 1-2, and 1-2 respectively. There is insufficient antecedent basis for this limitation in the claims.

Claims 5, 6, 21 and 22 recite the limitation "the additional address network" in line 1. There is insufficient antecedent basis for this limitation in the claims.

Claims 7 and 23 recite the limitation "the address network" in line 4. There is insufficient antecedent basis for this limitation in the claims.

Claims 8 and 24 recite the limitations "address packets" and "the address network" in lines 3, 5 and lines 3, 4 respectively. There is insufficient antecedent basis for these limitations in the claims.

Claim 11 recites the limitations "an address packet" and "the address packet" in lines 1 and 3. There is insufficient antecedent basis for these limitations in the claim.

Claim 12 recites the limitations "the address packet", "a memory subsystem", "address packets" in lines 3, 4 and 6. There is insufficient antecedent basis for these limitations in the claim.

Claim 14 recites the limitation "an address packet" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 27 recites the limitations "an address packet" and "the address packet" in lines 2 and 3. There is insufficient antecedent basis for these limitations in the claim.

Claim 28 recites the limitations "an address packet", "a memory subsystem", "the address packet" and "address packets" in lines 2, 3 and 6. There is insufficient antecedent basis for these limitations in the claim.

Claim 30 recites the limitation "an address packet" in line 2. There is insufficient

antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 1-2, 4-6, 10, 15-18, 20-22, 26 and 31-32 are rejected under 35 U.S.C.

103(a) as being unpatentable over Hagersten et al. (5,864,671) (Hagersten herein

after).

As per claim 1, 4-5, 16-17, 20-21 and 32, Hagersten teaches a system (fig. 1),

comprising:

a plurality of nodes (fig. 1, items 100, 102 etc.), wherein each node of the

plurality of nodes includes a plurality of active device coupled by an address network;

an inter-node network configured to convey communications between plurality of nodes

(col. 1, lines 15-24 and lines 44-52).

Hagersten fails to teach an address network in a node configured to convey

address packets in broadcast mode and a different address network in a different node

configured to convey address packets in point-to-point mode, but Hagersten teaches

different nodes with different configurations (i.e. different number of processors and

memory system per node, col. 1, lines 44-57). Hagersten also teaches advantages and

disadvantages of broadcast/point-to-point protocols in different number of active devices

(i.e. processors and memories) (col. 2, lines 23-36 and lines 56-60. Also it is well known

in the art that different protocols works better depending upon the size of the nodes, i.e.

broadcast in small number of devices and point-to-point in large number of devices, see

present application specification, paragraphs [0007]-[0010]). Hagersten teaches each

node with different configurations (i.e. varying number of active devices) as explained

above and thus it would have been obvious to one having ordinary skill in the art at the

time of the invention to configure some nodes conveying address packets in broadcast

mode and some nodes conveying address packets in point-to-point mode to improve

performance of the nodes and hence system.

As per claims 2, 6, 18 and 22, Hagersten fails to teach non-mapping/mapping

coherency unit, but teaches conveying all the address packets in "the node"/"the

different node" {this limitation "the node" (or "different node") maps to a node(s) of claim

1, conveying address packet in broadcast (or "point-to-point") mode}, which inherently

teaches conveying non-mapped/mapped address packets in broadcast/point-to-point

modes respectively in respective networks. (With respect limitation of non-

mapping/mapping, it is not disclosed in specification how to ascertain why the

coherency units are mapped/non-mapped, it is understood as, if there is enough space

in the memory, the global packet is mapped and if not enough space the node may not

map the packet in local memory).

As per claims 10 and 26, Hagersten teaches node includes directory with plurality of entries corresponding to different coherency units mapped a memory subsystem included in the node, wherein each entry contains an indication of whether a cached copy of a corresponding coherency unit has been created in one or more of the plurality of active devices included in the node (col. 2, line 63 – col. 3, line 15, col. 3, lines 30-43).

As per claims 15 and 31, Hagersten teaches different access rights (col. 3, lines 10-29) and different transactions to obtain ownership of the data (i.e. RTO or "read-to-own" with intent to change the data, RTS or "read-to-share") (col.3, lines 30-36). Hagersten also teaches that RTO changes ownership of packet with the RTO request (col. 3, line 65 – col. 5, line 20). Hagersten fails to explicitly teach change of ownership does not occur during RTS transaction (col. 5, line 50 – col. 6, line 21). The change of ownership (RTO transaction) of packet requires the other nodes in the network to invalidate their copies and send acknowledgement to requesting node of invalidation, which creates some traffic in the network. As per RTS transactions, an active device willing to share the data but not intent to change the data and do not require ownership during that transaction, thus it would have been obvious to one having ordinary skill in the art at the time of the invention not to change the ownership of the packet during RTO transaction to reduce network traffic and hence improved system.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 3, 14, 19 and 30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hagersten et al. (5,864,671) (Hagersten herein after) as applied to

claims 1-2 and 17-18 above, and further in view of Hagersten et al. (5,887,138)

(Hagersten #2 herein after).

As per claims 3 and 19, Hagersten teaches all limitations of claims 1-2, 10, 17-18

and 26 above and further teaches an interface with directory, which communicates to all

the nodes and directory, keeps records of the packets (fig. 3, col. 3, lines 3-9).

Hagersten also teaches sending coherency unit to home node (col. 4, lines 8-20).

Hagersten fails to teach interface with outstanding queues. Hagersten #2 teaches

interface with queues (fig. 2, items 72, 74 and fig. 3, items 92, 94, 96), which stores

transactions (col. 11, lines 25--28). It would have been obvious to one having ordinary

skill in the art at the time of the invention to provide interface with transaction queues as

taught by Hagersten #2 in the system of Hagersten to provide ordered transactions

(Hagersten #2, col. 11, line 29 – col. 12,line 35).

As per claims 14 and 30, Hagersten #2 teaches a system interface (i.e. mode

unit) determines the transmission protocols depending on several conditions, including

whether a coherency request is directed toward a local or global address. Hagersten #2

discloses that his interface uses several indications such as, whether the address is

global or local or there is a copy of requested memory block in additional local

memories in the other global units (col. 5, lines 21-25), access rights of the unit in

question (col.16, lines 22-28). The information in an MTAG table (fig. 3, item 68) is used

to determine access rights (col. 16, lines 10-25). It would have been obvious to one

having ordinary skill in the art at the time of the invention to convey packets based on

an address of the packet because as taught by Hagersten #2, when processor

accesses a portion of memory that is not local to the node it creates some network

traffic which may cause bottleneck (col. 4, line 20-50) and to reduce traffic congestion

by sending address packet based on address creates quick completion.

Claim Rejections - 35 USC § 103

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

12.   Claims 1-2, 4-6, 15-18, 20-22, 26 and 31-32 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Hagersten et al. (5,864,671) (Hagersten herein after) and

further in view of Martin et al. (US 6,883,070 B2) (Martin herein after).

As per claim 1, 4-5, 16-17, 20-21 and 32, Hagersten teaches a system (fig. 1),

comprising:

a plurality of nodes (fig. 1, items 100, 102 etc.), wherein each node of the

plurality of nodes includes a plurality of active device coupled by an address network;

an inter-node network configured to convey communications between plurality of nodes

(col. 1, lines 15-24 and lines 44-52).

Hagersten fails to teach an address network in a node configured to convey

address packets in broadcast mode and a different address network in a different node

configured to convey address packets in point-to-point mode, but Hagersten teaches

different nodes with different configurations (i.e. different number of processors and

memory system per node, col. 1, lines 44-57). Martin teaches that snooping protocols

are better for small systems (nodes) and directory protocols are better for large systems

(col. 1, line 66 – col. 2, line 7). Martin further teaches scalable system with varying loads

(col. 2, lines 8-33) where hybrid protocol is implemented which changes from broadcast

to point-to-point or vice-a-versa. It would have been obvious to one having ordinary skill

in the art at the time of the invention to utilize broadcast or point-to-point or hybrid

protocol as taught by Martin (depending upon the configuration of the system and

network traffic) in the system of Hagersten to improve system performance (Martin, col.

2, lines 33-43).

As per claims 2, 6, 18 and 22, Hagersten fails to teach non-mapping/mapping

coherency unit, but teaches conveying all the address packets in "the node"/"the

different node" {this limitation "the node" (or "different node") maps to a node(s) of claim

1, conveying address packet in broadcast (or "point-to-point") mode}, which inherently

teaches conveying non-mapped/mapped address packets in broadcast/point-to-point

modes respectively in respective networks. (With respect limitation of non-

mapping/mapping, it is not disclosed in specification how to ascertain why the

coherency units are mapped/non-mapped, it is understood as, if there is enough space

in the memory, the global packet is mapped and if not enough space the node may not

map the packet in local memory).

As per claims 10 and 26, Hagersten teaches node includes directory with

plurality of entries corresponding to different coherency units mapped a memory

subsystem included in the node, wherein each entry contains an indication of whether a

cached copy of a corresponding coherency unit has been created in one or more of the

plurality of active devices included in the node (col. 2, line 63 – col. 3, line 15, col. 3,

lines 30-43).

As per claims 10 and 26, Martin teaches node includes directory with plurality of

entries corresponding to different coherency units mapped a memory subsystem

included in the node (col. 5, lines 1-3), wherein each entry contains an indication of

whether a cached copy of a corresponding coherency unit has been created in one or

more of the plurality of active devices included in the node (col. 5, lines 18-25).

As per claims 11 and 27, Martin teaches, when an address packet is conveyed

by the address network in broadcast mode, the address packet is broadcast to each of

the plurality of active devices included in node regardless of information contained in

within the directory (col. 5, lines 52-57).

As per claims 12 and 28, Martin teaches, when an address packet is conveyed

by the address network in point-to-point mode, the address packet in conveyed to a

memory subsystem in the node {Martin teaches, memory system includes directory (see

col. 5, lines 4-7) and when packet is conveyed in point-to-point mode the packet is sent

to directory (col. 6, line 2), which inherently teaches sending packet to memory

subsystem); and the memory subsystem is configured to access the directory and

responsively send address packets to one or more plurality of devices (col. 6, lines 6-9).

As per claims 13 and 29, Martin teaches sending packets in broadcast mode as

well as point-to-point mode (col. 6, lines 19-21).

As per claims 15 and 31, Hagersten teaches different access rights (col. 3, lines

10-29) and different transactions to obtain ownership of the data (i.e. RTO or "read-to-

own" with intent to change the data, RTS or "read-to-share") (col.3, lines 30-36).

Hagersten also teaches that RTO changes ownership of packet with the RTO request

(col. 3, line 65 – col. 5, line 20). Hagersten fails to explicitly teach change of ownership

does not occur during RTS transaction (col. 5, line 50 – col. 6, line 21). The change of

ownership (RTO transaction) of packet requires the other nodes in the network to

invalidate their copies and send acknowledgement to requesting node of invalidation,

which creates some traffic in the network. As per RTS transactions, an active device

willing to share the data but not intent to change the data and do not require ownership

during that transaction, thus it would have been obvious to one having ordinary skill in

the art at the time of the invention not to change the ownership of the packet during

RTO transaction to reduce network traffic and hence improved system.

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

14.   Claims 7-9 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hagersten et al. (5,864,671) (Hagersten herein after) and Martin et al. (US

6,883,070 B2) (Martin herein after) as applied to claims 1-2 and 17-18 above, and

further in view of Hagersten et al. (5,887,138) (Hagersten #2 herein after).

As per claims 7-8 and 23-24, Martin teaches all the limitations of claims 1 and 17

as described above. Martin additionally teaches that his mode storage unit stores an

indication (Fig. 4, item 42) to control whether coherency requests are transmitted

through the network by a broadcast protocol or by a directory protocol (col. 6, lines 17-

24). Martin teaches that, based on the indication, selected coherency requests are

transmitted through the network by a directory protocol, and other coherency requests

are transmitted through the network by a broadcast protocol. (The limitation of claims 7

and 23 in the instant application)

Martin, however, does not expressly teach that the coherency mode storage unit

stores a plurality of additional indications to control which protocol should be used nor

that an address of the request is one of the indications used to dictate the transmission

protocol, as is claimed in claims 8 and 24.

Hagersten #2, (5,887,138), does teach these limitations, disclosing a

multiprocessing computer system which includes a plurality of processing units (fig. 1,

item 16) with individual caches (fig. 1, item 18), a shared memory (fig. 1, item 22), a

point to point network (fig. 1, item 14; also Col. 7, line 10) connecting the components,

and a system interface (i.e., mode storage unit) which determines the transmission

protocol (fig. 1, item 24; fig. 3; Col. 5, lines 18-24). Hagersten's system uses multiple

coherency protocols depending on several indications, including whether a coherency

request is directed toward a local or global address. Hagersten discloses that his

system interface uses several indications to determine the protocol used, namely:

Whether the address is local or global (Col. 5, lines 21-25); whether there is a

copy of the requested memory block in additional local memories in other global

units (Col. 5, lines 21-25); and the access rights of the unit in question. (Col. 16,

lines 22-28)

Hagersten #2 discloses that his system interface stores:

Translations from local to physical addresses, comparing several bits from the

requested address to information stored in the interface (Col. 13, line 59 to Col. 14,

line 3); and information in an MTAG table (68, Fig. 3) that is used to determine
access rights.

These indications are used in the determination of the protocol to be used (Col. 16,
lines 10-25)

At the time of the invention it would have been obvious to a person of ordinary skill
in the art to modify the system of Martin to include the storage of multiple indications for
protocol differentiation based on local / global address.

The suggestion for doing so is taught by Hagersten, on Col. 4, lines 20-50. The
distributed memory architecture format sometimes used for multiprocessor systems can
cause network congestion, creating a bottleneck. When a processor accesses a portion
of memory that is not local to the processor's own node, it must create some network
traffic. As lines 32-40 note, coherence requests directed to a shared memory segment
local to the processor's own node operate at a much higher bandwidth than requests
directed over the network to a memory segment that is not local. Therefore, it would
have been obvious to try to find a way to decrease the disadvantage that non-local
coherence requests experience. A logical conclusion would be that the protocols that
work well for local requests might not work well for non-local requests, because they
create a bandwidth problem. Martin, in Page 1, Par. 7, notes that certain protocols that
work quickly for small systems are not as desirable for large systems because they
create a lot of network traffic, and that other protocols, while slower and more complex,
(lines 3-4) use less bandwidth and would be better for use in non-local requests sent
over a network.

Therefore it would have been obvious to modify the system of Martin by adding the limitations of Hagersten described above to create a system that has the advantage of quick request completion for both local addresses and non-local addresses, to obtain the invention as specified in claims 7-8 and 23-24.

As per claims 9 and 25, Martin teaches changing conveyance mode of packet based upon bandwidth utilization (col. 7, lines 10-40). Thus, Martin inherently teaches dynamically updating the indication that address packet specifying a given coherency unit can be transmitted by different coherency modes at different times.

Conclusion

15.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaushikkumar Patel whose telephone number is 571-272-5536. The examiner can normally be reached on 8.00 am - 4.30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kaushikkumar Patel
Examiner
Art Unit 2188

kmp

MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER